

IN THE CLAIMS:

Please amend the claims as shown below.

1. (Currently Amended) An osteogenic sponge composition useful for the induction of new bone growth in a mammal, comprising:

a resorbable sponge matrix material, said resorbable sponge matrix material being three-dimensionally stable but flexible;

an osteogenic factor, said osteogenic factor incorporated in said sponge matrix material in an amount that causes an increased rate of resorption of said sponge matrix material in a mammal; and

particulate mineral having an average particle diameter of at least about 0.5 mm embedded in said resorbable sponge matrix material, said particulate mineral present in a weight ratio of at least 4:1 relative to said resorbable sponge matrix material, so as to provide a scaffold for bone ingrowth in the presence of said osteogenic factor.

2. (Original) The osteogenic sponge composition of claim 1, wherein said particulate mineral is present in a weight ratio of at least about 10:1 relative to said resorbable sponge matrix material.

3. (Previously Amended) The osteogenic sponge composition of claim 1, wherein said osteogenic factor comprises a bone morphogenetic protein (BMP), a LIM mineralization protein, or a nucleotide sequence encoding a bone morphogenetic protein or a LIM mineralization protein.

4. (Original) The osteogenic sponge composition of claim 1, wherein said resorbable sponge matrix material includes collagen.

5. (Original) The osteogenic sponge composition of claim 3, wherein said resorbable sponge matrix material includes collagen.

6. (Original) The osteogenic sponge composition of claim 1, wherein said particulate mineral is selected from the group consisting of bone particles and biocompatible synthetic calcium phosphate ceramics.

7. (Original) The osteogenic sponge composition of claim 6, wherein said particulate mineral comprises biphasic calcium phosphate.

8. (Original) The osteogenic sponge composition of claim 7, wherein said biphasic calcium phosphate has a porosity of at least about 50%.

9. (Original) The osteogenic sponge composition of claim 8, wherein said particulate mineral includes bone particles.

10. (Original) The osteogenic sponge composition of claim 9, wherein said bone particles are cortical bone particles.

11. (Original) The osteogenic sponge composition of claim 1, which is comprised at least about 95% by weight of said particulate mineral.

12. (Original) The osteogenic sponge composition of claim 1, wherein said particulate mineral has an average particle size in the range of about 0.5 mm to about 5.0 mm.

13. (Previously Amended) The osteogenic sponge composition of claim 1, wherein said particulate mineral has an average particle size in the range of about 1 to about 2 mm.

14. (Original) The osteogenic sponge composition of claim 1, wherein said osteogenic factor is a bone morphogenetic protein.

15. (Original) The osteogenic sponge composition of claim 14, wherein said bone morphogenetic protein is a recombinant human protein.

16. (Original) The osteogenic sponge composition of claim 15, wherein said bone morphogenetic protein is BMP-2 or BMP-7.

17. (Original) The osteogenic sponge composition of claim 16, further comprising an osteogenic enhancing factor selected from the group consisting of autographic bone marrow, allographic bone marrow, transforming growth factor- $\beta$ , fibroblast growth factor, platelet-derived growth factor, insulin-like growth factor, microglobulin- $\beta$ , and steroids.

18. (Original) An osteogenic sponge composition effective for the induction of new bone growth in a primate, comprising:

a resorbable sponge matrix material;

an osteogenic factor that stimulates osteoblasts and osteoclasts, said osteogenic factor incorporated in said sponge matrix material in an amount that causes an increased rate of resorption of said sponge matrix material in the primate; and

particulate mineral having an average particle diameter of at least about 0.5 mm embedded in said resorbable sponge matrix material, said particulate mineral present in a weight ratio of at least 4:1 relative to said resorbable sponge matrix material, so as to provide a mineral scaffold for a duration sufficient for osteoid ingrowth through an area in which said sponge composition is implanted.

19. (Original) The sponge composition of claim 18 wherein the primate is a human.

20-41. (Canceled)

42. (Currently Amended) An osteogenic sponge composition for the induction of new bone growth in a primate, comprising:

a three-dimensionally stable but flexible carrier consisting essentially of a resorbable sponge matrix with particulate mineral embedded in said resorbable sponge matrix, said particulate mineral present in an amount constituting at least about 95% by weight of said carrier; and

an osteogenic factor.

43. (Currently Amended) A highly mineralized sponge implant device consisting essentially of a resorbable sponge matrix formed of lyophilized collagen and having particulate biocompatible mineral embedded within said matrix, said device comprised 1% to 3% by weight of the lyophilized collagen and 97% to 99% by weight of the particulate biocompatible mineral.

44. (Previously Amended) The device of claim 43 wherein the particulate biocompatible mineral comprises bone particles.

45. (Previously Amended) The device of claim 43 wherein the particulate biocompatible mineral includes a synthetic ceramic.

46. (Currently Amended) The device of claim ~~44~~ 45 wherein the ceramic material includes a calcium phosphate ceramic.

47. (Previously Amended) The device of claim 46 wherein the calcium phosphate ceramic is biphasic calcium phosphate.

48. (Currently Amended) An osteogenic implant, comprising:  
a three-dimensionally stable but flexible resorbable matrix carrier comprised 1% to 3% by weight of collagen in sponge form and 97% to 99% by weight of a particulate biocompatible mineral embedded within said collagen; and  
an osteogenic factor.

49. (Original) An interbody spinal fusion device, comprising:  
a load bearing member sized for insertion between adjacent vertebrae; and  
a composition according to any of claims 1-19 and 42-48 retained by said load bearing member.

50. (Canceled)

51. (Previously Added) An osteogenic sponge composition comprising a highly mineralized sponge implant device of claim 43 and an osteogenic factor.

52. (Previously Added) The osteogenic sponge composition of claim 51 wherein the collagen comprises telopeptide collagen.

53. (Previously Added) The osteogenic sponge composition of claim 52, wherein the osteogenic factor comprises a bone morphogenic protein.

54. (Previously Added) The osteogenic sponge composition of claim 53, wherein the bone morphogenic protein comprises BMP-2 or BMP-7.

55. (Previously Added) The osteogenic sponge composition of claim 54, wherein the bone morphogenic protein comprises BMP-2.

56. (Previously Added) The osteogenic sponge composition of claim 51, wherein the particulate biocompatible mineral has an average particle diameter of at least about 0.5 millimeters.

57. (Previously Added) The device of claim 43, wherein the particulate biocompatible mineral has an average particle diameter of at least about 0.5 millimeters.

58. (Previously Added) The device of claim 57, wherein the particulate biocompatible mineral has an average particle diameter in the range of about 0.5 millimeters to about 5 millimeters.

59. (Previously Added) The device of claim 58, wherein the particulate biocompatible mineral has an average particle diameter of about 1 millimeter to about 3 millimeter.

60. (Currently Amended) A highly mineralized sponge implant device, said device being three-dimensionally stable but flexible, said device comprising a resorbable sponge matrix and a particulate biocompatible mineral embedded within said matrix, said device comprised 1% to 3% by weight of a material forming said sponge matrix, and 97% to 99% by weight of the particulate biocompatible mineral.

61. (Previously Added) A device according to claim 60, also comprising an osteogenic factor.

62. (Previously Added) The device of claim 61, wherein the osteogenic factor comprises a bone morphogenic protein.

63. (Previously Added) The device of claim 62, wherein the bone morphogenic protein comprises BMP-2 or BMP-7.

64. (Previously Added) The device of claim 63, wherein the bone morphogenic protein comprises BMP-2.

65. (Currently Amended) The osteogenic sponge composition of claim 1, wherein said resorbable sponge matrix material comprises lyophilized collagen ~~composition is three-dimensionally stable but flexible.~~

66. (Currently Amended) The osteogenic sponge composition of claim 18, wherein said resorbable sponge matrix material comprises lyophilized collagen.~~composition is three-dimensionally stable but flexible.~~

67. (Currently Amended) The osteogenic sponge composition of claim 42, wherein said resorbable sponge matrix comprises lyophilized collagen.~~carrier is three-dimensionally stable but flexible.~~

68. (Currently Amended) The highly mineralized sponge implant device of claim ~~60~~ 43, wherein said resorbable sponge matrix comprises fibrillar collagen.~~device is three-dimensionally stable but flexible.~~

69. (Currently Amended) The osteogenic implant of claim 48, wherein said carrier is comprises fibrillar collagen.~~three-dimensionally stable but flexible.~~

70. (Currently Amended) The highly mineralized sponge implant device of claim 60, also comprising an osteogenic factor.~~wherein said device is three-dimensionally stable but flexible.~~

71. (Previously Added) The highly mineralized sponge implant device of claim 70, wherein said resorbable sponge matrix comprises collagen, and said particulate biocompatible mineral comprises biphasic calcium phosphate.

72. (Currently Amended) The highly mineralized sponge implant device of claim 70, also comprising wherein said osteogenic factor comprises BMP-2 or BMP-7.